INSTALLATION RESTORATION PROGRAM:

NAVAL AIR STATION WILLOW GROVE,

HORSHAM TOWNSHIP, PA

Introduction

This fact sheet provides information about the Navy Installation Restoration (IR) Program. The purpose of the IR program is to identify and clean up hazardous waste sites at Navy installations. The progress made at Naval Air Station (NAS) Willow Grove is summarized below.

Program Summary

3-1-92

The IR Program consists of four distinct phases: Preliminary Assessment (PA), Site Inspection (SI), Remedial Investigation/Feasibility Study (RI/FS), and Remedial Action (RA). These phases are implemented sequentially with each phase determining whether the subsequent phase is necessary. The Navy has convened a Technical Review Committee (TRC) for the IR Program at NAS Willow Grove which includes representatives of the U.S. Environmental Protection Agency (EPA), the Pennsylvania Department of Environmental Resources (PADER), and Horsham Township. The TRC meets on a regular basis and provides review and comment on all IR Program work plans and study documents. As always, the Navy's primary concern is the protection of the health and welfare of our people and our neighbors.

The Naval Air Station at Willow Grove includes both Navy and Air Force facilities. As part of the IR Program, Preliminary Assessments (PA) were completed for NAS Willow Grove in 1984 and 1986. The purpose of the PAs was to identify sites posing a potential threat to human health or the environment as a result of contamination from past installation operations or waste disposal practices. The PAs included interviews with past and present base personnel and review of historical records and aerial photographs. Sixteen potential sites were identified at NAS Willow Grove. They are shown on the map enclosed. Navy sites are identified with the prefix NAS, and Air Force sites are identified by the prefix ARF. The three water production wells on the installation, NW-1, NW-2, and AFW-1 are also shown on the map. The PA studies concluded that none of the sites identified as potentially contaminated posed an immediate threat to human health or the environment.

However, the Air Force concluded that the PA results for Air Force sites 1, 2, and 3 confirmed the presence of contamination, and initiated an RI/FS at these sites. Navy Sites 1 through 5 and Air Force Sites 4 through 6 were recommended for further investigation to confirm potential contamination and assess possible long term environmental impacts. The Navy decided to continue investigations at Navy sites 7, 8, and 9 to verify the absence of contamination despite the PA recommendation of no further work. The next step in the Navy IR Program at NAS Willow Grove was a Site Inspection (SI). The purpose of the SI was to confirm or deny the presence of hazardous substances. Before commencement of the SI in 1988, Navy Site 10 was added. The SI was completed in 1989 by EA Engineering, Science, and Technology, Inc. (EA). Navy Sites 1, 2, 3, 5, 10, and ARF Site 5 were recommended for additional work. Navy Sites 4, 8, and 9 and Air Force Sites 6 and 7 were found not to warrant further investigation.

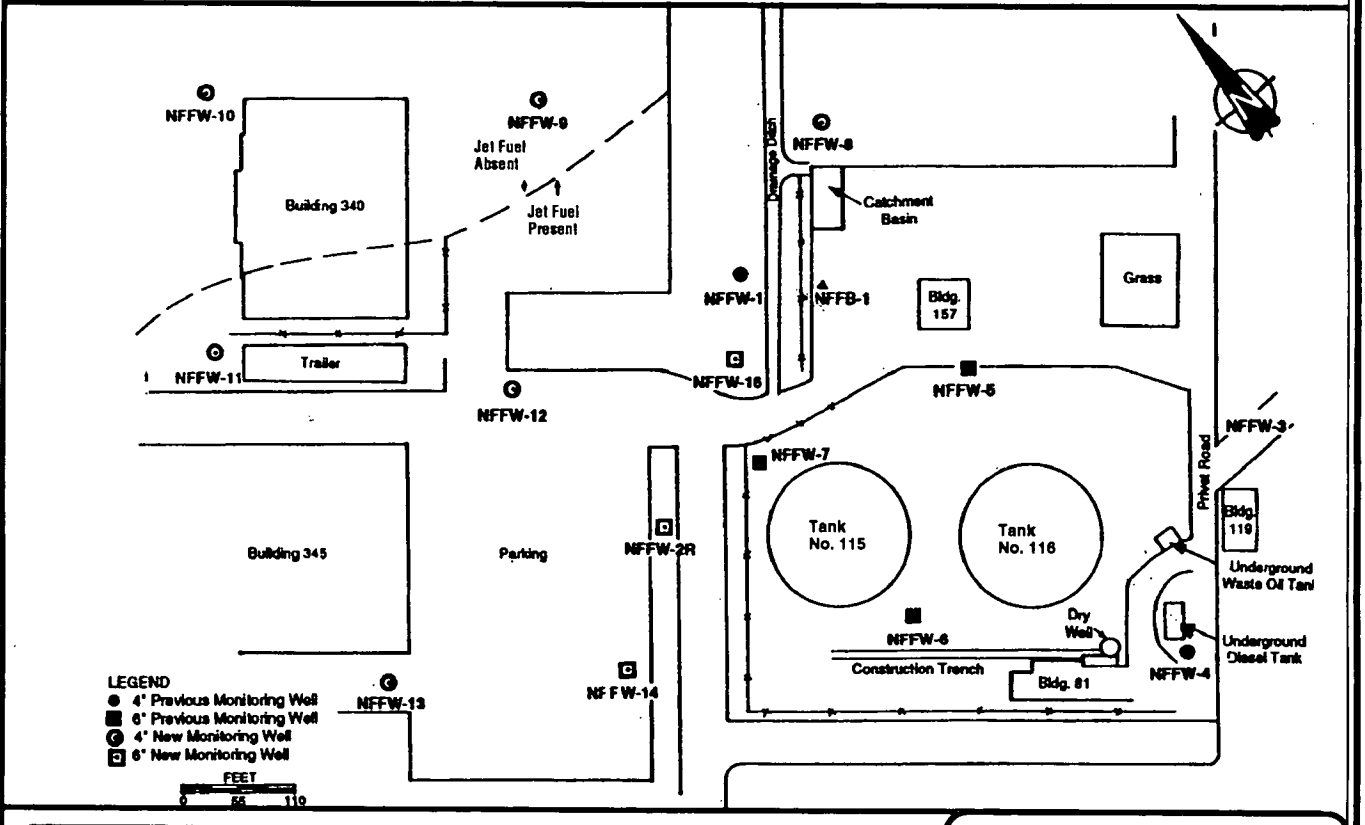
Navy Sites 1, 2, 3, 5, 10, and Air Force Site 5 were recommended for a Remedial Investigation (RI). The purpose of an RI is to characterize the nature and extent of contamination the presence of which had been confirmed by the SI. The remaining two sites, Navy Site 7 and Air Force Site 4, were recommended for an Extended Site Inspection (ESI). An ESI is performed if the results of the SI are uncertain and further confirmation is necessary before a recommendation can be made.

Subsequent to the SI, Navy Site 10 was placed on an accelerated schedule. Additional work was performed there during the Summer of 1991 with a goal of beginning cleanup of this site in 1992. The field investigations for the RI and ESI were conducted in the fall of 1991. Results for the ESI indicated that Navy Site 7 could be deleted from the IR Program and that further monitoring was appropriate for Air Force Site 4. Preliminary results from the RI are due to be released in late Spring 1992. A summary of the IR Program sites investigated, work progress, contaminants of concern, and media affected is shown in Table 1.

We will keep you informed of our future progress and we encourage you to take an active interest in our efforts to safeguard your environment.

Navy Fuel Farm - NAS 10

The Navy Fuel Farm (NAS 10) is the main storage area for jet fuel at NAS Willow Grove. In 1988 test borings made at a nearby Air Force construction site found jet fuel in the soil and ground water. The only probable source was the 210,000 gallon fuel tanks of the Navy Fuel Farm (see figure below). The Navy contracted EA to immediately drill 18 test borings to assess the extent of the fuel contamination and added the site to the SI. Seven monitoring wells were installed around the main fuel tanks and a test boring was made in the parking area of the Fuel Farm during the SI. The presence of contamination was confirmed in both soil and ground water beneath the site. Based on these results the Navy decided to accelerate IR studies at this site and replace the obsolete fuel farm facilities. In the spring and summer of 1991, nine additional monitoring wells were installed to assess the extent of the contamination, and pumping tests were conducted to assess the flow of ground water and contaminants underground. Phased construction of the new above-ground tanks and fuel farm facilities began in the spring of 1991, and the removal of one tank and the contaminated soil beneath it occurred that fall. The second tank is scheduled for removal in the spring of 1992 and the new facilities will be fully operational in the fall. Potential leakage from the new tanks will be easier to monitor as they include spill detection and containment measures.



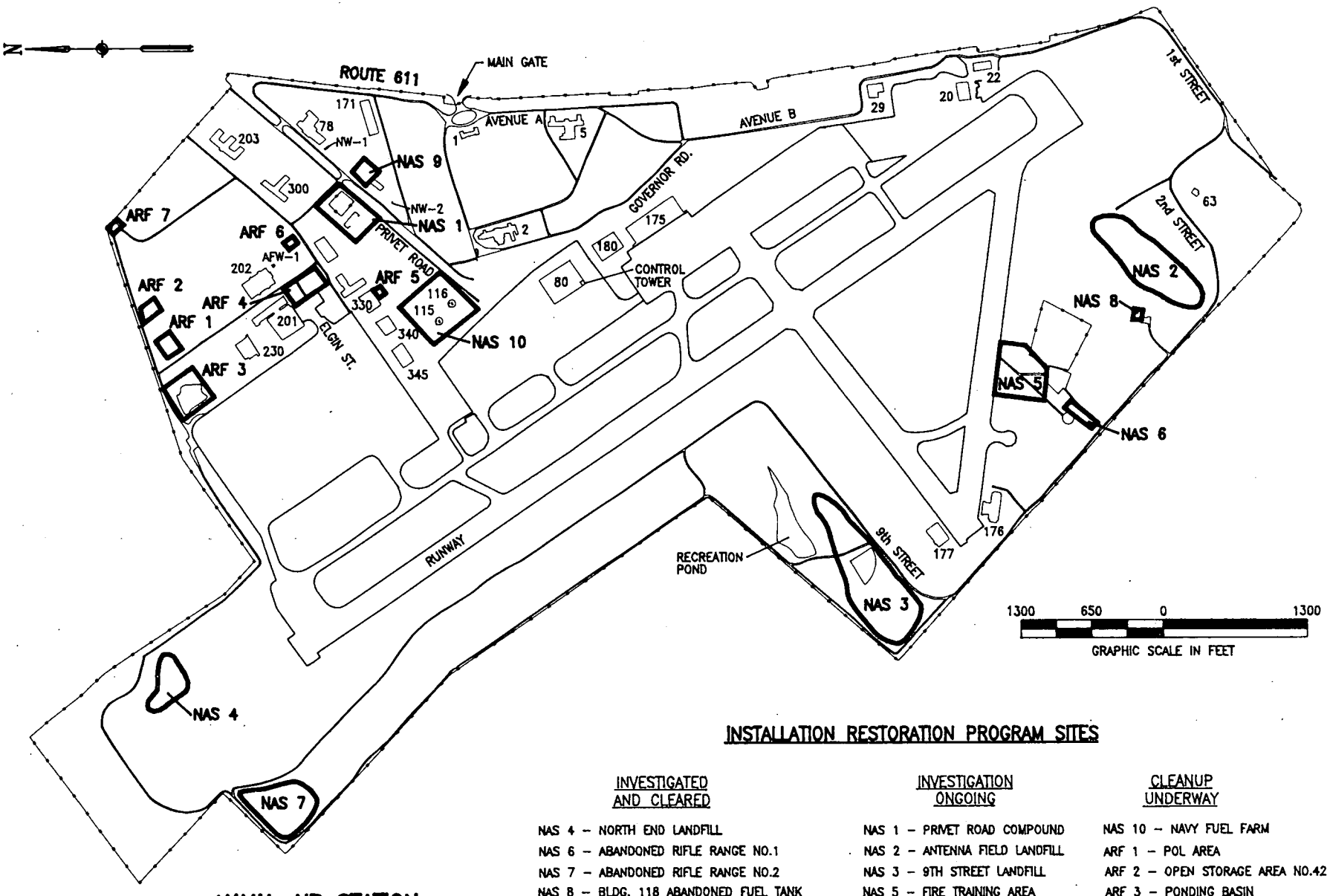
Jet Fuel (JP-5)

Jet fuel is a mixture of gasoline and kerosene which is used to power jet engines. Large quantities of this fuel have been stored at NAS Willow Grove over the years of its operation.

Jet fuel will begin to decompose in the environment upon exposure to air and certain bacteria found in the soil. The rate of breakdown is dependent on the amount of oxygen present. Some of the components of jet fuel or its breakdown products are harmful to humans and animal life if sufficient quantities are ingested or inhaled. Benzene is a well known example. Experimental dosages of benzene in laboratory animals have shown that ingestion of benzene can cause weight loss, depression of bone marrow output, and cancer. Permissible levels of benzene in drinking water are defined by federal drinking water standards. Standards for benzene and other regulated compounds in jet fuel are shown in Table 2. Under the IR Program these standards may serve as cleanup goals.

TABLE 2
FEDERAL DRINKING WATER STANDARDS
Parts per Billion (ppb)

Benzene	5
Toluene	1,000
Ethylbenzene	700
Xylenes (total)	10,000



NAVAL AIR STATION WILLOW GROVE

INSTALLATION RESTORATION PROGRAM SITES

INVESTIGATED AND CLEARED

- NAS 4 – NORTH END LANDFILL
- NAS 6 – ABANDONED RIFLE RANGE NO.1
- NAS 7 – ABANDONED RIFLE RANGE NO.2
- NAS 8 – BLDG. 118 ABANDONED FUEL TANK
- NAS 9 – STEAM PLANT BLDG. 6 TANK OVERFILL
- ARF 5 – BLDG. 330 WASTE OIL STORAGE AREA
- ARF 6 – HEATING PLANT
- ARF 7 – OLD WELL HOUSE

INVESTIGATION ONGOING

- NAS 1 – PRIVET ROAD COMPOUND
- NAS 2 – ANTENNA FIELD LANDFILL
- NAS 3 – 9TH STREET LANDFILL
- NAS 5 – FIRE TRAINING AREA
- ARF 4 – WASHRACK AREA

CLEANUP UNDERWAY

- NAS 10 – NAVY FUEL FARM
- ARF 1 – POL AREA
- ARF 2 – OPEN STORAGE AREA NO.42
- ARF 3 – PONDING BASIN

FILE: BMAP

TABLE 1 SUMMARY OF IR PROGRAM INVESTIGATIONS

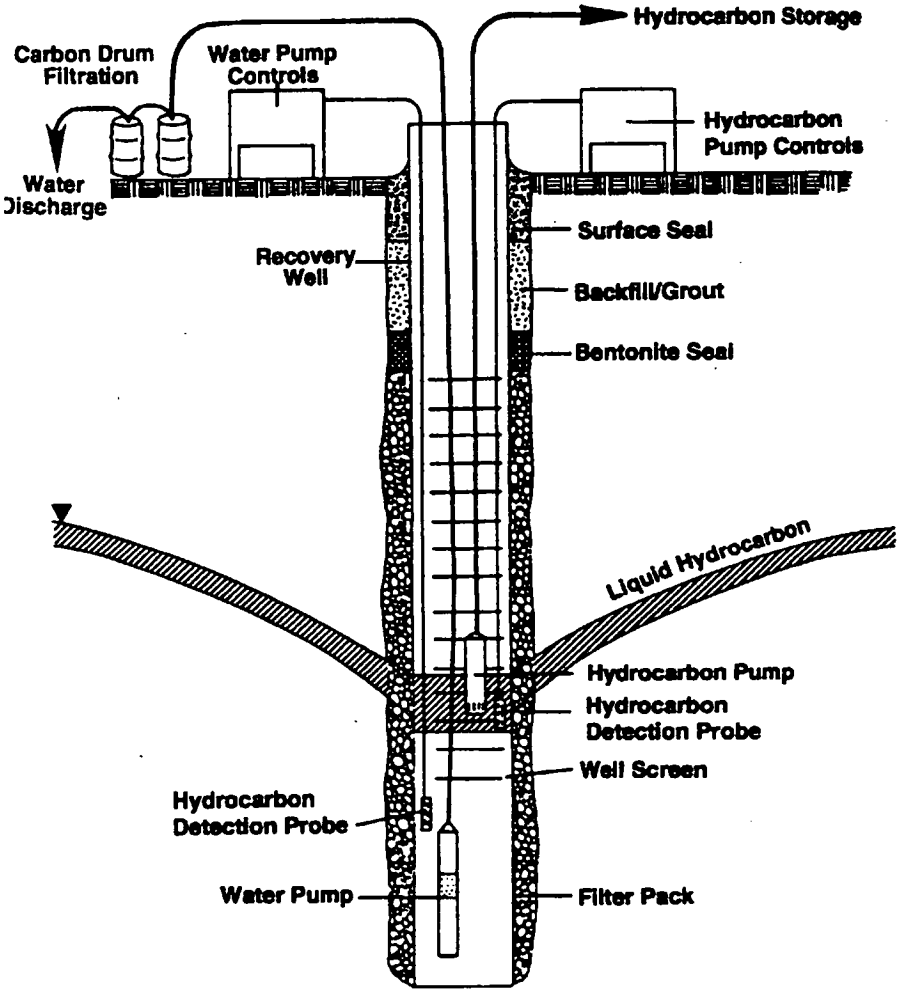
Potentially Contaminated Site	*PA Recommendation for SI*	*SI Performed*	*SI Recommendation*	*ESI Recommendation*	*Chemicals of Concern*	*Media*
NAS Site 1, Privet Road Compound	Yes	Yes	RI/FS		VOC, Pesticides, PCB	Ground Water, Surface Water, Sediment
NAS Site 2, Antenna Field Landfill	Yes	Yes	RI/FS		Pesticides	Surface Water and Sediment
NAS Site 3, 9th Street Landfill	Yes	Yes	RI/FS		VOC, Pesticides	Ground Water, Surface Water, Sediment, Soil
NAS Site 4, North End Landfill	Yes	Yes	NFI		---	---
NAS Site 5, Fire Training Area	Yes	Yes	RI/FS		VOC	Ground Water
NAS Site 6, Abandoned Rifle Range No. 1	No	No	NFI		---	---
NAS Site 7, Abandoned Rifle Range No. 2	No	Yes	ESI	NFI	---	---
NAS Site 8, Building No. 118 Abandoned Fuel Tank	No	Yes	NFI		---	---
NAS Site 9, Steam Plant Building No. 6 Tank	No	Yes	NFI		---	---
NAS Site 10, Navy Fuel Farm	NA	Yes	RI/FS		Jet Fuel	Ground Water
ARF Site 1, POL Area	Yes	An RI/FS managed by the Air Force has been completed				
ARF Site 2, Open Storage Area No. 42	Yes	An RI/FS managed by the Air Force has been completed				
ARF Site 3, Ponding Basin	Yes	An RI/FS managed by the Air Force has been completed				
ARF Site 4, Washrack Area	Yes	Yes	ESI	Continue Ground-Water Monitoring	VOC	Ground Water
ARF Site 5, Building No. 330 Waste Oil Storage Area	Yes	Yes	*		Hydrocarbons	Soil
ARF Site 6, Heating Plant	Yes	Yes	NFI		---	---
ARF Site 7, Old Well House	Yes	No	NFI		---	---

PA = Preliminary Assessment
ESI = Extended Site Inspection
NFI = No Further Investigation
VOC = Volatile Organic Compounds
SI = Site Inspection
RI/FS = Remedial Investigation/Feasibility Study
** = Further Investigation within the scope of NAS Site 10*
PCB = Polychlorinted Biphenyls

Ground-Water Cleanup Technologies

Remediation is the process of cleaning up and removing unwanted contaminants at a site. At the Navy Fuel Farm, the main contaminant is jet fuel which has seeped into the ground in the vicinity of the storage tanks and entered into the underlying ground water. Ground water is underground water which moves slowly through the ground under the influence of gravity. Generally it follows the lay of the land until it reaches a body of water such as a stream or pond into which it discharges. The jet fuel is both dissolved in the ground water and floating on the surface of the ground water in a separate layer as it slowly migrates in the direction of ground-water flow. Ground water travels much more slowly than water in a stream or river since it actually has to flow through soil pores and rock fractures. Tests at the Navy Fuel Farm reveal that the ground water moves at an average rate of only 25 ft/yr.

To remove the jet fuel from the ground water, a recovery well is drilled downhill from the source and the contaminated ground water is pumped out. The floating jet fuel is pumped out separately by a special pump called a skimmer pump and stored for potential recycling. The remaining contaminated water is run through activated charcoal which effectively removes all the dissolved jet fuel. The clean water is then discharged. The figure below shows a schematic diagram of such a "pump and treat" remediation system. A test system of this type is planned for the Navy Fuel Farm in 1992. If successful the system will be expanded as required to achieve a cleanup of the site as rapidly as possible.



Future

Environmental restoration is ongoing at NAS Willow Grove. As preliminary remediation begins at the Navy Fuel Farm this year, the installation-wide data collected in the RI phase will be fully evaluated and a risk assessment will be performed for each site. After risk to human health and the environment has been fully assessed and the sites prioritized, a Feasibility Study (FS) will be conducted for each site requiring remediation to determine the options for cleanup and select the most appropriate technology for site remediation. Once this task is completed, remediation will begin at the appropriate sites to achieve acceptable cleanup levels. As always, the Navy's primary concern is the protection of the health and welfare of our people and our neighbors. We will keep you informed of our progress and we encourage you to take an active interest in our efforts to safeguard your environment.

Technical Review Committee

Northern Division, Naval Facilities Engineering Command is tasked with the management and administration of the current IR Program studies at NAS. In accordance with the requirements of the Superfund Amendments and Reauthorization Act (SARA) of 1986, Northern Division has established a Technical Review Committee (TRC). This committee actively participates in the development of the scopes of work for investigations, and provides technical review and comment during the execution of the studies, and the selection of remedial technologies based on data gathered by the Navy's consultants. The overall objective of the TRC is to keep all interested parties informed and involved in the Navy's IR Program. The NAS TRC is comprised of representatives of the U.S. Environmental Protection Agency, the Pennsylvania Department of Environmental Resources, Horsham Township, theAir Force, the Navy, and the Navy's consultants.

Public Information Program

As part of the Installation Restoration Program studies being conducted at NAS Willow Grove, the Navy is planning to implement a formal Public Information Program. This program will ensure a means to distribute information to the community and allow for community involvement.

It is our intention to provide information on the Installation Restoration Program to you, the community, through a series of newsletters and fact sheets. We would like you to share in a communication exchange with us and respond to information concerning NAS Willow Grove by sharing your questions and concerns. This will allow us to be more responsive to your needs and interests.

An information repository (a file of our plans and studies) is available at the Horsham Township Municipal Building. If you have any questions, please contact Ensign Monica Arnow at 443-1776, or write to:

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